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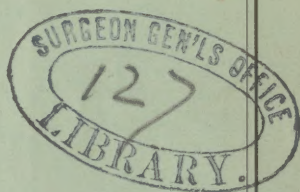
RADICAL CURE OF HERNIA.

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THE RADICAL CURE OF HERNIA.

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IN practically considering the question of operation for radical cure of hernia, it might be well to bear in mind that in all cases, most or all of the following conditions will be found to be present :

1. A weakness and enlargement of the so-called rings or canals through which the rupture passes.

In inguinal and umbilical hernia especially, this enlargement is at times very great, even sufficient to allow the introduction of several fingers. It must be remembered, however, that this is not a real opening or breach from a mechanical lesion, but a simple stretching or protrusion of a naturally weak spot in the abdominal walls, and is often found as a congenital defect.

2. The formation of a covering or sac for the protruded viscera out of a stretched and displaced portion of the parietal peritoneum.

It is now conceded by most modern surgeons, that a hernia is very rarely caused by a sudden or violent straining or pressing of the abdominal contents through a simply weakened ring. On the contrary, it is more than probable that the defect is either congenital or of comparatively slow formation through a gradual local relaxation of the abdominal walls, and a correspondingly gradual stretching and pocketing of the peritoneum through the abdominal openings to form the hernial sac; the giving way of the rings being but a late manifestation of the lesion. Patients who suppose they have suddenly been ruptured are really deceived; the rupture with its peritoneal covering has been forming for some time before, and only becomes apparent externally at the moment of some unusual exertion of the abdominal compressors, which forces the mass farther outward.

3. An abnormal lengthening and, at times, hypertrophy of the protruded viscera, and an elongation of their mesenteric attachment or support, by which a constant tendency to recurrence of the protrusion is favored, even after the most careful reposition.

4. In large herniæ, which have for a long time remained unreduced, such a lessening in the capacity of the abdominal cavity that the herniated portions can with difficulty be accommodated.

This condition I found very pronounced in operating on a large scrotal hernia which had been unreduced for many months; and a second time in a case of large congenital umbilical hernia, the child being but a few days old. Here, after having divided the strangulating bands, although there was no obstacle at the opening to the return of the intestine, the greatest difficulty was experienced in finding room for it within the abdomen.

With these facts before us, it would seem that an open or weak ring, plays by no means, the most important part in the formation and continuance of a rupture. If, therefore, it be admitted that a rupture depends for a cause upon something more than a sudden forcing of viscera through a weakened portion of the abdominal walls, it is fair to conclude that, in order to accomplish a thoroughly permanent cure, it must be necessary to remedy all of these organic changes just mentioned, and yet since with our present knowledge we are able to cope with none but the first (enlarged rings, etc.), it remains a question whether the operations commonly known as radical, really deserve the name, inasmuch as they neither affect the tendency to sac formation nor shorten the lengthened mesentery, etc., and only aim at overcoming the lesser—perhaps secondary—causes of the ruptures, viz., the enlarged abdominal canals or rings through the building up of mechanical external barriers of greater or less strength at these points. Under such circumstances it can hardly be a matter of much surprise that these operations have not met with more success.

In spite, however, of the almost insurmountable difficulties in the way of obtaining a really radical cure, cases will constantly arise in which an operation for the closure or narrowing of the hernial openings may be called for, and the only question then

is, to what length we may go in our admission of cases to this class. At the present time most surgeons agree that a radical operation can only be recommended when the rupture is very annoying, and either not reducible, or, if reducible, cannot be held by a truss; or finally, when the hernia, in spite of every care, tends to increase rapidly in size.

It is for the future to decide whether these indications may or may not be increased through the employment of more effective methods than we now possess.

The various ways in which cures have been attempted may be considered as follows:

Posture—Natural Cures.—A very necessary factor in any radical cure is, that the abdominal contents shall not at any time enter the canals, and so long as the horizontal position and quiet is preserved, there is but little liability of this occurring.

Cases have been reported where patients, obliged on account of other illness to lie quiet for a long period have, upon their recovery, found their ruptures entirely cured.

Pressure.—In young people, and when the hernial passages are not large, a cure can occasionally be accomplished through the application of carefully adjusted pressure over the ring and sac by means of the hernia truss. The action of the truss upon the ring, is not to bring its edges together, but simply to prevent any prolapse of the viscera, for if the protrusion is but once allowed to occur, the treatment is entirely thwarted, and must be again started from the very beginning. Hence the necessity, where a radical cure is expected, of insisting upon the wearing of the truss both by night and day.

The further action of the truss is upon the sac, particularly at its neck, where, by the constant and firm pressure of its serous surfaces against each other, an adhesive inflammation is finally set up sufficient to cause closure of its cavity.

In order that the pressure be effective, it is of course necessary that the truss pad be made of some hard though polished material, such as wood, ivory, or hard rubber, and that it be sufficiently large to overlap the edges of the hernial ring, for if it is smaller, the integuments will be pushed into the open ring, and, acting

as a wedge, will tend rather to enlarge than contract the opening.

With children under ten years, in whom the prospects of cure are far surer than at any other age, the truss should be worn for at least two years uninterruptedly, and for a third year leaving it off only at night or when lying. In adults a cure will sometimes take place in this way, but only when the truss is worn continuously for many years, and when the rupture has been small. After the removal of the truss, when a cure has apparently taken place, the greatest precaution should be taken against abdominal straining or sudden exertions.

Operations.—The object of all the more purely operative methods has been in a general way to obliterate by inflammatory action the hernial passages from the rings outward. Some, particularly the earlier operations, were directed mainly toward the obliteration of the hernial sac and the closure of its neck, while in the more modern procedures, the aim has been to include the hernial ring in the operation.

The earliest accounts of the radical operation for hernia are found in the writings of Celsus, who advised that the tissues overlying the hernia be carefully cut through until the hernial sac was exposed, when, the ring being enlarged, the viscera were replaced and the wound allowed to heal by granulation. This would seem to have been simply our present operation for strangulation without opening the sac, as no mention is made of any interference with this, his object evidently being to produce a dense cicatrix, which was to act as a barrier to the recurrence of the prolapse. In others of his writings, however, he mentions the cutting into and removal of a portion of the sac, and at times overlying integuments, for the purpose of producing a cicatricial shortening of the soft parts.

Heliodorus, in the time of Trajan, advised and practiced the extirpation of the sac at as high a point as possible.

Leonides, of Alexandria, in the beginning of the third century, believed that the formation of a tough scar through the application of the hot iron was the most favorable operation.

In the early part of the seventh century, Paul of Ægina, after laying bare the sac of a scrotal hernia, transfixed it near the neck

with a double ligature and tied it tightly in halves. The sac below the ligature was then cut through and removed, *together with the testicle*. In other cases the sac was invaginated by means of a probe, and stitched fast inside the inguinal ring, there to act as a sort of plug. This idea was again revived in the operations of Gerdy, Würtzer, and others in more recent times.

Following the teachings of Paul of Ægina, the method of castration was practiced by numbers of irresponsible travelling operators (so-called rupture cutters) from those early times, up to within less than a hundred years ago, and singular as it may seem, not only did large numbers of the victims survive this barbarous operation, but many were permanently cured.

In one diocese in Germany there were found five hundred children and two hundred adults castrated.

In the early part of the eighteenth century, Freytag, of Zürich, dissected down upon the sac, returned its contents, and tied the neck as high as possible. The ligature ends were brought out through the wound, and left till they came away by suppuration. Although this operation was said to be quite successful, and was practiced by a number of surgeons of that time, it soon fell into disuse, and was for some time replaced by crude endeavors to block the passages with an eschar formed by caustics or the hot iron.

Petit condemned such operations, and advised that the sac, after having been freed of all adhesions, should be pushed through the hernial ring, as high in the abdomen as possible, the wound being left to heal by granulation. As, however, his results were not satisfactory, he finally discouraged even this, and advised his patients to be satisfied with a well-fitted truss.

Ligation of the neck of the sac, as practiced at intervals from the seventh to the fifteenth century, was really tantamount to the castration operation of Paul of Ægina, inasmuch as the spermatic cord was included by the ligature. It was not until the sixteenth century that Ambrose Paré performed ligation without injury to the cord. Rousset, Petit, Abernethy, Langenbeck, and others, followed him in practicing the same operation until the early part of this century. The plan consisted in thoroughly freeing the neck of the sac, and after the reposition of its con-

tents, tightly ligating it as high as possible. The sac below the ligature was then cut through, and the ligated stump replaced within the canal.

About this same period Le Blanc, Sharp, and others, laid open the parts and stitched together the edges of the ring or canal, leaving the sutures till suppuration had set in. This operation has been in late years repeated, with slight modifications, in this country, by James Wood and S. D. Gross, with tolerable success.

For more than a century past, attempts have been made by various operators, to obliterate the hernial sac by cutting into it, and introducing foreign bodies for the purpose of exciting profuse suppurative inflammation, but they have been found very unsatisfactory.

Thus Bonnet, in the early part of this century, passed needles through the sac in such a manner, that by means of corks, with which they were provided, a constantly increasing pressure could be made upon its walls. Later Belmas introduced pieces of dried gelatin, with a needle constructed for the purpose, and left them there, in the hope of causing sufficient inflammatory action to close the sac.

Maesner passed threads through the neck of the sac and allowed them to remain for two or three weeks, and although he claimed this to be a radical operation, he nevertheless did not allow the patients so operated on to go about without a truss. The unusual number of fatal cases following this method, soon brought it into disrepute.

Up to the present century, most of the operations, as has been shown, consisted in laying bare the sac by a dissection ; but since that time the subcutaneous methods have taken the preference, and instead of exciting suppurative action in the tissues, the setting up of a simple adhesive inflammation was attempted.

Velpeau was the first to employ subcutaneous injection of irritants into the sac, the idea suggesting itself to him from the success he had obtained by this means in the radical cure of hydrocele. The operation was done with a small trocar and canula, the latter having openings in the side.

Guerin and others sought a similar result in subcutaneous

scarification of the sac, and although the risks were slight, but few cases of cure were reported.

The recurrence of the hernia after this and similar operations was so constant as to oblige surgeons to turn their attention to other methods offering surer results. As experience had already taught that the organic plugging of the canal with the inverted hernial sac, as practiced by Petit and others, was not only ineffectual, but, as it required the dissection of the overlying parts, was a more or less dangerous operation, the idea of invaginating all the soft parts for the plug, was suggested by Gerdy, and in 1835 carried into effect by him. He describes the operation about as follows, it being of course applicable to inguinal hernia only. The viscera being carefully replaced, the scrotal tissues are caught upon the point of the index finger of the left hand and pushed as high as possible through the inguinal ring; then a threaded fixed needle, with an eye in the point, is slipped along the finger until the point reaches the top of the invaginated tissues, when it is thrust through all the overlying parts and made to appear on the abdominal surface, and one end of the ligature is drawn out. The needle, without unthreading, is then drawn back till the point is again on the scrotal side, when, at a short distance from the first puncture, it is a second time thrust through to the abdominal surface. The other ligature end is then unthreaded and the needle withdrawn entirely. The ends of the loop so formed are then tightly fastened, while the inverted scrotum is thoroughly pushed up with the finger or a sound. A caustic application is now applied to the contiguous inverted scrotal integument, the object being to cause union of the raw surfaces, and so secure for the inguinal canal a firm organic plug.

The original method of Gerdy has since been much modified, both by himself and others, but the principle of invagination remains the same in all. In 1838 Würtzer, of Bonn, Germany, considering that the simple adhesion of the invaginated scrotum to the neck of the sac was insufficient to hold the scrotum in place, endeavored to accomplish a complete obliteration of the invaginated anterior wall of the sac. For this purpose he had constructed a so-called *invaginatorium*, consisting of two plates, one of which being passed into the inguinal canal, instead of the

finger, is held in place by a long needle passed through it and the abdominal walls into the second plate, which is made so to articulate with the first that it lies immediately over it upon the abdomen, and by means of a screw the soft parts held between the plates are gently compressed until the included sac-wall is obliterated.

Max Langenbeck and Valette went still further than Würtzer, and by means of a greater pressure of modified plates and the use of active caustics, produced an actual gangrene of the parts lying between them.

Other operations of a similar character have, from time to time, been introduced, as, for instance, that of Wood, of London, and Agnew, of Philadelphia; but they are all only greater or less modifications of Gerdy's method, and have been attended by but little, if any better result. We have no knowledge of the number of cases cured by Gerdy, but it is well known that there were four fatal cases out of sixty-two treated by him; a mortality sufficient to cast it out from a place among recognized surgical procedures.

Owing to the discouraging results of these late attempts, the radical operation for a number of years fell into marked disfavor with the majority of surgeons, and no new method was offered to the profession until 1876, when Dr. Dowel, of Texas, brought forward his plan of circumclusion of the boundaries of the inguinal canal. After making sure that the hernia has been entirely reduced, he passes the index finger into the inguinal canal, carrying ahead of it the tissues of the scrotum. The only instrument used is a semicircular needle, about three inches long, sharpened and eyed at either end, and carrying a heavy silk thread. This needle is entered about an inch and a half above the external ring, and passed *behind* the invaginating index finger across the canal, and brought out on the opposite side, near Poupart's ligament. Before the second point of the needle has left the tissues it is again made to cross the canal backwards, as it were, but this time in front of the finger, and reappears at the first opening or point of entrance. The needle is then unthreaded and withdrawn, leaving the ligature loop entirely encircling the canal, and the cord hanging from a common opening. A silver wire is now fastened to the silk thread, and as the latter is with-

drawn the wire naturally follows and takes its place. After a number of such stitches have been introduced, they are each firmly tightened over a compress of lint. They are all removed on the eighth day, and the patient allowed to go about on the twelfth. Dr. Dowel reports a large per cent. of cures in this way, but a longer period of observation will be required before a correct judgment can be formed as to the value of this method.

From the time of Velpeau to the present decade, the method by subcutaneous injection of an irritant or astringent fluid had been entirely without advocates, but a few years since, Schwalbe, of Germany, and Heaton, of Boston, revived the practice.

The former injected into the ring and tissues about it, a small quantity of alcohol, at intervals of five to nine days, and claimed for the limited number of cases treated a uniformly good result.

The *Heatonian method* consists in the hypodermic application to the ring and contiguous tissues, of a few drops of the fluid extract of *Quercus alba*, or white-oak bark. The operation was given to the profession by Dr. Warren, who was an assistant of Dr. Heaton. The latter, it is said, practiced this operation for a long time as a secret method.

The instrument used by Dr. Heaton is the ordinary hypodermic syringe, the needle of which is provided with orifices on the sides, for the purpose of making a lateral distribution of the liquid.

The instrument has been variously modified by Drs. Warren, of Boston, Janney, of Philadelphia, and Dr. Garmo, of New York.

In performing the operation, the hernia must first be entirely reduced. A finger being then introduced into the inguinal ring, to act as a guide to the point of the syringe-needle, the latter is thrust into the abdominal walls until it lies in close relationship to the ring and canal, when by slowly screwing the piston home, about 10 minims of the extract is deposited in the tissues. A firm compress is now carefully bound over the parts, and the patient put to bed for a fortnight.

Those who have practiced this procedure claim very good success from it.

The injection fluid is prepared as follows: Evaporate the fluid

extract of white-oak bark to the consistency of glycerin. To this add an equal quantity of absolute alcohol, and to a half ounce of this mixture, add a half drachm of Sulphuric ether and two grains of Morphia sulphate.

A new epoch appears to have been opened for the radical cure of hernia, by the general introduction of Lister's *antiseptic treatment*, especially in England and Germany. The brilliant results attending its application to almost every department of surgery, has induced operators, particularly in the above-mentioned countries, to attempt to utilize it for the purpose of more safely reintroducing the old operation of Celsus and Heliodorus, which had been discarded more on account of the danger attending them, than because of doubt as to the correctness of the principles underlying them.

To Steele, of England, belongs the credit of having first applied the Lister method to this operation. In an article, published in 1874, in the *British Medical Journal*, he gives the details of an operation upon an eight-year-old boy, with a large congenital inguinal rupture, in which he freshened the columns of the ring, and drew them together with two catgut sutures without disturbing the sac. Recurrence took place six months after, when the operation was repeated. A year later there was no sign of return; the patient had, however, worn a truss since the last operation.

Since Steele's case, most of the reports of the Lister method have been from Germany. The operation has generally consisted in cutting down upon the sac, and where it can be emptied with certainty, it is ligated tightly at the neck with the catgut ligature or carbolized silk. The edges of the ring are then brought together with continuous or interrupted stitches, proper drainage is provided, and the wound of the integuments closed. The strictest antiseptic precautions are observed throughout, and the carbolized spray kept playing on the parts till the dressings are applied. In a number of cases the sac has been removed below the ligature at its neck, especially when it was found necessary to open it for the purpose of replacing its contents within the abdominal cavity. The time occupied in healing has varied from two weeks to two months; the average being about twenty-eight

days. In many cases union took place without febrile reaction or other unfavorable symptoms, but in a few it has been complicated with abscess, sloughing of integuments, etc.

Out of about seventy cases reported since 1876, by Annandale, Nussbaum, Czerny, Socin, and others, there have been but one death and six recurrences. Many of these operations, however, have been done so recently, as to render it impossible to judge as to the true proportion of recurrences.

Within the past two years I have operated on three cases,—two of inguinal and one of femoral,—in this manner. In but one (inguinal) was the carbolized spray used. In each the sac was opened in order to replace viscera, and tied at the neck, but not removed. From three to five interrupted sutures were applied to the edges of the ring in each. Catgut ligatures were used in two cases; in the other carbolized silk. The temperature rose from two to three degrees in each, and suppuration took place in all. All recovered in three, six, and seven weeks respectively. My first case (inguinal) was done nearly two years ago, and recurrence took place five months later, but was easily held by a truss, which could not be done before the operation. The second and third have remained sound for five and seven months respectively, and without a truss.

The following conclusions may be arrived at after a careful study of the cases operated by this method, up to the spring of 1879:

1. In strangulated hernia, both femoral and inguinal, after relieving the stricture and returning the bowel, the hernial sac should be ligated as high as possible, cut through below the ligature and removed entirely. As an additional precaution, the edges of the ring may be brought together with interrupted sutures. Every antiseptic precaution must be observed.

2. In irreducible hernia, and in the reducible variety when a truss will not properly hold it back, this operation for radical cure may be performed with but little risk to the life of the patient.

3. In inguinal hernia, a truss should be worn as a precautionary measure after the operation, except perhaps in young individuals. In femoral cases this will seldom be required even in adults.

